**Remarks/Arguments**

This Amendment responds to the Office Action of May 30, 2008 reopening prosecution of the above-identified U.S. Regular Patent Application following the filing of an Appeal Brief, and payment of Appeal fees by Applicant.

In that Action, the Examiner rejected claims 1, 3, 4 and 6, all of the claims remaining in this application, under section 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,943,477 to Rao *et al.*

While Applicant appreciates the fact that the previous lodging of an Appeal in this case has created a recognition that Applicant's arguments supporting patentability have created an environment justifying the reopening of prosecution regarding this case, Applicant remains concerned that the Examiner still does not understand the very plain patentable difference which exists between what Applicant claims and the teachings and suggestions of the single cited and applied prior art reference.

More specifically, after engaging in a careful review of the Examiner's comments presented in the most recent Office Action, Applicant is made vividly aware of the fact that the Examiner has failed to understand both (a) that Applicant's invention involves, very specifically, the complexities of multi-level halftoning rather than the more simple, and quite different, aspects of bitonal halftoning to which the cited and applied Rao *et al.* reference disclosure is limited, and (b) that Applicant's multi-level color-image halftoning methodology is designed for handling both *physical and optical dot-gain* printing problems. On this latter point, Applicant's specification states very clearly at the beginning that Applicant's invention has this aim, whereas the plain text

in the cited and applied reference points out that the reference disclosure does not involve -- is not concerned with -- the important issue of optical dot gain.

On the matter of the important differentiation which exists between multi-level halftoning and bitonal halftoning, not only is the general technical literature on this point quite clear, so also is the relevant patent literature contained in the USPTO patent "library" to which the Examiner has easy access:

For example, from the text in U.S. Patent No. 5,633,729 (with certain emphasis added):

> ***Bi-tonal halftoning***: ". . . a bi-tonal halftoning system operates by comparing each intensity value sample to a matrix of threshold levels and generates *a halftone cell corresponding to each intensity value*." (Column 2, lines 19-22.)
>
> ***Multi-level halftoning***: ". . . multi-level halftoning replaces each black or white pixel in a bi-tonal halftone cell with a *pixel* having a value selected from a number of *values available for each pixel*. In essence, multi-level halftoning redistributes the intensity of a single intensity value into *a plurality of (pixel) intensity values within a halftone cell*." (Column 2, lines 61-66.)

And from the text in U.S. Patent Application Publication No. 2006/0244981 (also with certain emphasis added):

> ***Bi-tonal halftoning***: ". . . bi-tonal digital halftoning converts a plurality of digitized intensity values representing a continuous tone image into a plurality of halftone dots, *where each halftone dot . . . corresponds to a single intensity value.*" (From Paragraph [0005], second *italicized text* added to complete the intended thought).
>
> ***Multi-level halftoning***: ". . . multi-level halftoning replaces each black or white pixel in a bi-tonal halftone cell with a pixel having a value selected from a number of values available for each pixel. In

essence, multi-level halftoning redistributes the intensity of a single intensity value into *a plurality of intensity values* . . . *within a halftone cell.*" (From Paragraph [0010], second *italicized text* added to complete the intended thought).

These well-recognized prior-art definitions involving and differentiating multi-level halftoning and bilevel halftoning must be taken into account in understanding that Applicant's claimed invention is focused on *a per-pixel dot-gain intensity-control methodology* -- a methodology which is implemented through the singular, corrective, instrumentality-application of a calibrated correction-introducing curve to effect changes, where necessary, in *individual pixel* intensity values -- changes making corrected pixel-intensity data suitable for feeding into an input stream, such as a printing-data input stream, intended for delivery to a multi-level output device, such as a multi-level color printer. As Applicant's descriptive specification aptly states, in relation to the use of the mentioned correction curve to implement *per-pixel* intensity value changes: ". . . a special dot-gain intensity correction *curve is generated to control*, effectively, *the infeed intensity* (infeed to the output device) *of each pixel in a halftoned, device-infeed pixel data stream.*"

Pixel-individual intensity correction which is characteristic of multi-level halftoning is significantly different from bilevel, whole-cell, or whole-dot, (i.e., plural-pixel) intensity correction. The Rao *et al.* reference does neither teach nor suggest *per-pixel* dot-gain intensity correction. Regarding this issue, and with all due respect to his attempt at claim-disabling argument, the Examiner's reference, on Page 3 in the Action, to text appearing in Columns 3 and four of Rao *et al.* does not point to anything remotely approaching a teaching or a suggestion to

one skilled in the art that would lead such a person to come up with Applicant's unique multi-level halftoning methodology.

With regard, then, to this differentiation between Applicant's multi-level halftoning methodology and the limited, bitonal methodology which is described in the Rao *et al.* reference, appropriate to yet modest revisions have been proposed in the currently amended claims 1, 3, 4 and 6 to emphasize, with greater impact, the differentiating multi-level halftoning behavior characteristic of Applicant's claimed methodology.

As mentioned also above, another very important distinction between Applicant's disclosed and claimed invention and the technology described in the Rao *et al.* reference is that Applicant's invention is designed, as specifically described in the Applicant's specification, to deal with *both physical dot-gain and optical dot-game*. This distinguishing behavioral feature of Applicant's invention is now more specifically set forth in his currently amended claims.

The Rao *et al* reference is pointedly "unconcerned" with, and thus completely unrelated to, handling optical dot-gain -- a dot-gain phenomenon associated particularly with eye-interactive behavior in relation to certain printed material. A popular definition of optical dot-gain is stated as follows: "Optical dot gain refers to the appearance of a given halftone to the human eye densitometer when viewed at normal viewing conditions."

Here is how Rao *et al.* boldly announces lack of interest in this "optical" phenomenon:

> "In this invention, *we are not concerned with modeling the properties of* light, ink, paper and *eye interactions*. Such work has been done by Neugebauer, Murray-Davies, ***Yule- Nielsen***, Clapper-

> Yule, BeerBouguer, Kubelka-Munk, and others as described in Henry Kang's book, Color Technology for Electronic Imaging Devices, SPIE Optical Engineering-Press, 1997, which is incorporated herein by reference in its entirety. However, none of these models is concerned with the effect of neighboring pixels on the amount of ink deposited at a given pixel, which is the central contribution of the present invention." (Column 1, lines 57-67, Emphases Added)

The highlighting immediately above of the joint-authorship reference to ***Yule-Nielsen*** relates to the following:

> "The scattering of light within paper can affect the tone characteristics of a printed halftone image. A halftone image is formed by variation in the average reflectance, which is determined by the size of the ink dots. Photon migration within the paper from noninked to inked regions tends to increase the photon absorption and thus decrease the halftone reflectance-the dots are effectively larger than their physical size. *This effect is known as optical dot gain or as the Yule-Nielson effect.*" (Emphasis Added) (The Journal of Imaging Science and Technology -- See the single page of the attached Appendix).

Another matter to note with interest regarding the above-quoted portion of the Rao *et al.* text which disclaims any interest in dealing with optical dot-gain is the very clear and dramatically made statement that ". . . [concern] . . . *with the effects of neighboring pixels on the amount of ink deposited at a given pixel point* . . . [is] . . . *the central contribution of the present invention*."(Emphasis Added) Applicant has pointed out previously during the prosecution of the present patent application that his concern, and more specifically the concern of his methodology, has nothing to do with a focus aimed at controlling the amount of ink deposited at a "given pixel". Clearly, this "*central* Rao *et al. contribution*" has nothing to do with Applicant's invention.

For each of the several important reasons stated above, it is very clear that the

single cited and applied Rao *et al.* reference is not properly effective to support an obviousness rejection of Applicant's claims, particularly as those claims are now presented in their currently amended forms. Major differentiation exists between the teachings and suggestions of the cited and applied reference and the claimed features of Applicant's methodology. The cited and applied reference is limited to and focused upon bitonal halftoning which has features and characteristics dramatically different from those inherent in multi-level halftoning. Among many of those important distinctions are the fact that, in bitonal halftoning, whole groups of pixels, known as cells or dots, are treated to have a common intensity value in terms of dealing with dot-gain, whereas in a multi-level situation, each individual pixel, on a pixel-by-pixel basis, is intensity controlled within the confines of a plural-pixel cell or dot.

Additionally, the features set forth in Applicant's claimed invention are expressly aimed at dealing with both physical dot gain and the phenomenon known as optical dot gain, whereas the Rao *et al.* reference very dramatically distances itself from possessing any concern whatsoever for handling optical dot-gain.

Accordingly, with entry of this Amendment, all currently amended claims now presented in this application are very clearly distinguishable patentably over anything shown or suggested by the cited and applied prior art, and are therefore patentable. Given all of the above, favorable reconsideration of this application, and allowance of all currently presented claims, are respectfully solicited. If the Examiner has any questions regarding the amendment or remarks, the Examiner is invited to contact Attorney-of-Record Jon M. Dickinson, Esq., at 503-504-2271.

**Request for Extension of time in Which to Respond**

Applicant(s) hereby request an Extension of Time Under 37 C.F.R. §1.136(a) for a two-month extension. A PTOForm 2038 Credit Card authorization in the amount of $490.00 is enclosed to pay the requisite extension fee. The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any over-payment to Account No. 22-0258.

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Respectfully Submitted,

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